

# Rapid web development

with



{name: "mongo", type: "DB"}

Manuel Kroiss

# Example data: Organisms

Name	Drosophila melanogaster
Habitats	temperate, tropical, terrestrial
Lifespan	0.3 years
Discoverer	Meigen, 1830

# with MySQL

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organisms

Id	Name	Habitats	Lifespan	Discoverer
1	Drosophila melangonaster	temperate,tropical,terrestrial	0.3	Meigen, 1830



# with MySQL

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organisms

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# with MySQL

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Habitats	temperate, tropical, terrestrial
Lifespan	0.3 years
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organisms

Id	Name	Lifespan	DiscovererName	DiscovererYear
1	Drosophila melangonaster	0.3	Meigen	1830

organism\_habitats

OrganismId	Habitat
1	temperate
1	tropical
1	terrestrial



# with MySQL+PHP



```
mysql_insert("INSERT INTO organisms SET name='Drosophila melangonaster', lifespan='0.3',  
discovererName='Meigen', discovererYear='1830'");  
  
$id = mysql_last_insert_id();  
  
mysql_insert("INSERT INTO organism_habitats (organismid, habitat) VALUES ($id, 'temperate'), ($id,  
'tropical'), ($id, 'terrestrial')");
```

## organisms

Id	Name	Lifespan	DiscovererName	DiscovererYear
1	Drosophila melangonaster	0.3	Meigen	1830

## organism\_habitats

OrganismId	Habitat
1	temperate
1	tropical
1	terrestrial



ZU 0666',0,0); DROP DATABASE TABLE;



PASIKOWSKI Sp. z o.o. ul. Białe 10-12 00-000 Warszawa

```
$str = get_plate_number();  
mysql_insert("INSERT INTO table1 VALUES (plate, field2, field3) SET ('$str', 33, 1)");
```

```
INSERT INTO table1 VALUES (plate, field2, field3) SET ('ZU 0666', 0, 0);
```

```
DROP DATABASE tablice;
```

```
---', 33, 1)
```



# with MySQL+PHP



```
mysql_insert("INSERT INTO organisms SET name='Drosophila melangonaster', lifespan='0.3',  
discovererName='Meigen', discovererYear='1830'");  
  
$id = mysql_last_insert_id();  
  
mysql_insert("INSERT INTO organism_habitats (organismid, habitat) VALUES ($id, 'temperate'), ($id,  
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## organisms

Id	Name	Lifespan	DiscovererName	DiscovererYear
1	Drosophila melangonaster	0.3	Meigen	1830

## organism\_habitats

OrganismId	Habitat
1	temperate
1	tropical
1	terrestrial



# with XML documents

Name	Drosophila melanogaster
Habitats	temperate, tropical, terrestrial
Lifespan	0.3 years
Discoverer	Meigen, 1830

```
<?xml version="1.0" encoding="UTF-8"?>
<organism>
  <name>Drosophila melangonaster</name>
  <habitats>
    <habitat>temperate</habitat>
    <habitat>tropical</habitat>
    <habitat>terrestrial</habitat>
  </habitats>
  <lifespan>0.3</lifespan>
  <discoverer name="meigen" year="1830" />
</organism>
```

OBJECTS to/from

**<?xml?>**

# with JSON documents

Name	Drosophila melanogaster
Habitats	temperate, tropical, terrestrial
Lifespan	0.3 years
Discoverer	Meigen, 1830

```
{  
  "name": "Drosophila melangonaster",  
  "habitats": ["temperate", "tropical", "terrestrial"],  
  "lifespan": 0.3,  
  "discoverer": {  
    "name": "Meigen",  
    "year": 1830  
  }  
}
```

## Types:

- String
- Number
- Boolean
- Object
- Array
- Null

# with JSON documents

Name	Drosophila melanogaster
Habitats	temperate, tropical, terrestrial
Lifespan	0.3 years
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```
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  "name": "Drosophila melangonaster",  
  "habitats": ["temperate", "tropical", "terrestrial"],  
  "lifespan": 0.3,  
  "discoverer": {  
    "name": "Meigen",  
    "year": 1830  
  }  
}
```

## Types:

- String
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- Boolean
- Object
- Array
- Null

obj.habitats[0]

obj.discoverer.name

**FILE/CONFIG/CLASS**

- Database server
- JSON Document-Storing
- Structure: Database -> Collections (Table without Structure) -> Documents (Rows)
- Index any field
- Made for big data
- Each inserted Document is assigned an ObjectId



{name: "mongo", type: "DB"}

```
var fly = {  
  "name": "Drosophila melangonaster",  
  "habitats": ["temperate", "tropical", "terrestrial"],  
  "lifespan": 0.3,  
  "discoverer": {  
    "name": "Meigen",  
    "year": 1830  
  }  
}
```

```
db.organisms.insert(fly);
```



{name: "mongo", type: "DB"}

```
db.organisms.find();
```

```
{  
  "_id": ObjectId("507f191e810c19729de860ea"),  
  "name": "Drosophila melangonaster",  
  "habitats": ["temperate", "tropical", "terrestrial"],  
  "lifespan": 0.3,  
  "discoverer": {  
    "name": "Meigen",  
    "year": 1830  
  }  
}
```

organisms @mysql1\_europe

Id	Name
1	Drosophila melangonaster



organisms @mysql2\_america

Id	Name
1	Drosophila melangonaster



{name: "mongo", type: "DB"}

organisms @mysql1\_europe

Id	Name
1	Drosophila melangonaster
2	Ant



organisms @mysql2\_america

Id	Name
1	Drosophila melangonaster

organisms @mysql1\_europe

Id	Name
1	Drosophila melangonaster
2	Ant



organisms @mysql2\_america

Id	Name
1	Drosophila melangonaster
2	Ant

organisms @mysql1\_europe

Id	Name
1	Drosophila melangonaster
2	Ant



organisms @mysql2\_america

Id	Name
1	Drosophila melangonaster
2	Dog
2	Ant

organisms @mysql1\_europe

Id	Name
1	Drosophila melangonaster
2	Ant



organisms @mysql2\_america

Id	Name
1	Drosophila melangonaster
2	Dog
2	Ant

organism\_habitats @mysql1\_europe

OrganismId	Habitat
2	terrestrial



{name: "mongo", type: "DB"}

organisms @mysql1\_europe

Id	Name
1	Drosophila melangonaster
2	Ant



organisms @mysql2\_america

Id	Name
1	Drosophila melangonaster
2	Dog
2	Ant

organism\_habitats @mysql1\_europe

OrganismId	Habitat
2	terrestrial

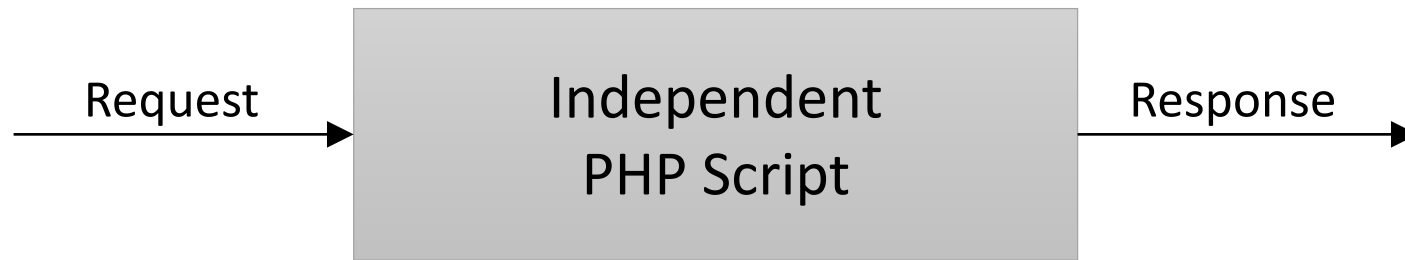
MongoDB uses ObjectIds  
globally unique, across servers!

507f191e810c19729de860ea

# Webserver



- No global variables



No running process! No knowledge about other users!

# Webserver



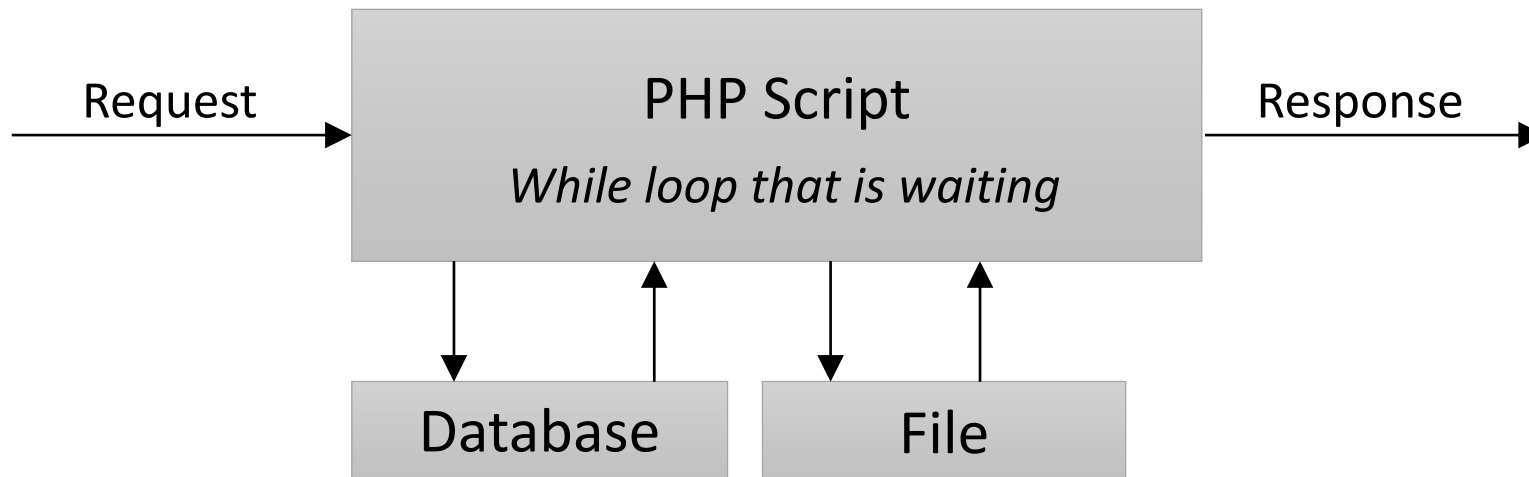
- No global variables
- URL rewrite with Apache mod\_rewrite in .htaccess

```
RewriteEngine On
RewriteBase    /xyz
RewriteRule ^page/([a-z]+)$ index.php?module=page&name=$1 [QSA]
RewriteRule ^admin/([a-z\.]+)$ admin.php?module=$1 [QSA]
```

# Webserver



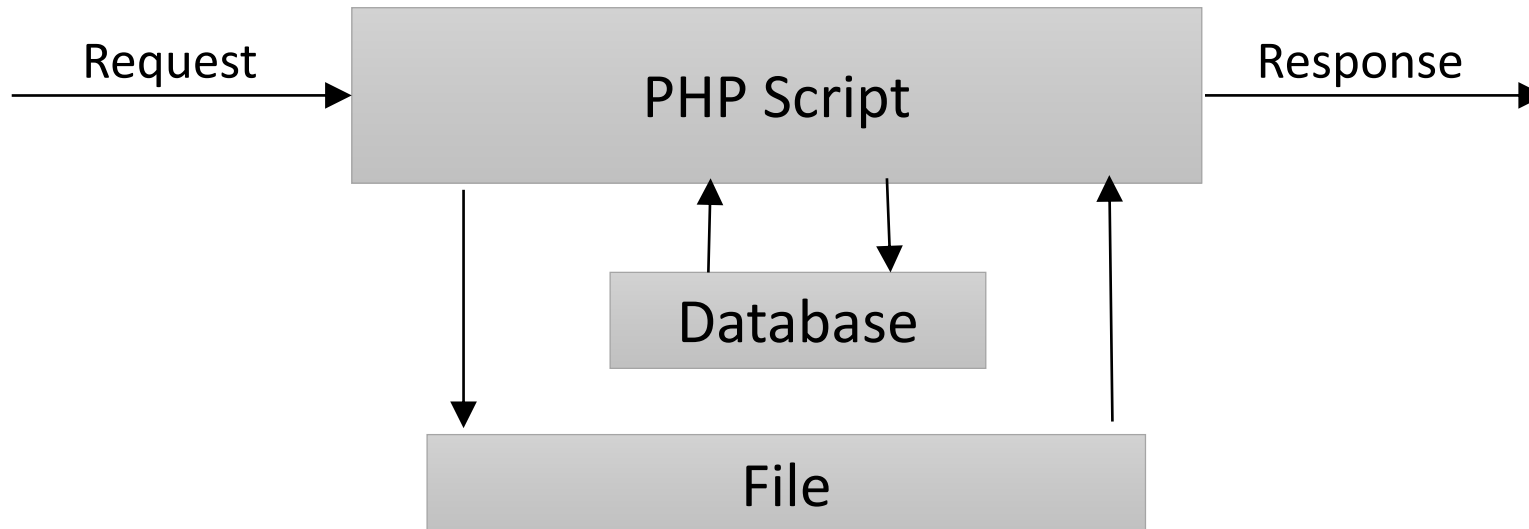
- No global variables
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- Thread Blocking



# Webserver



- No global variables
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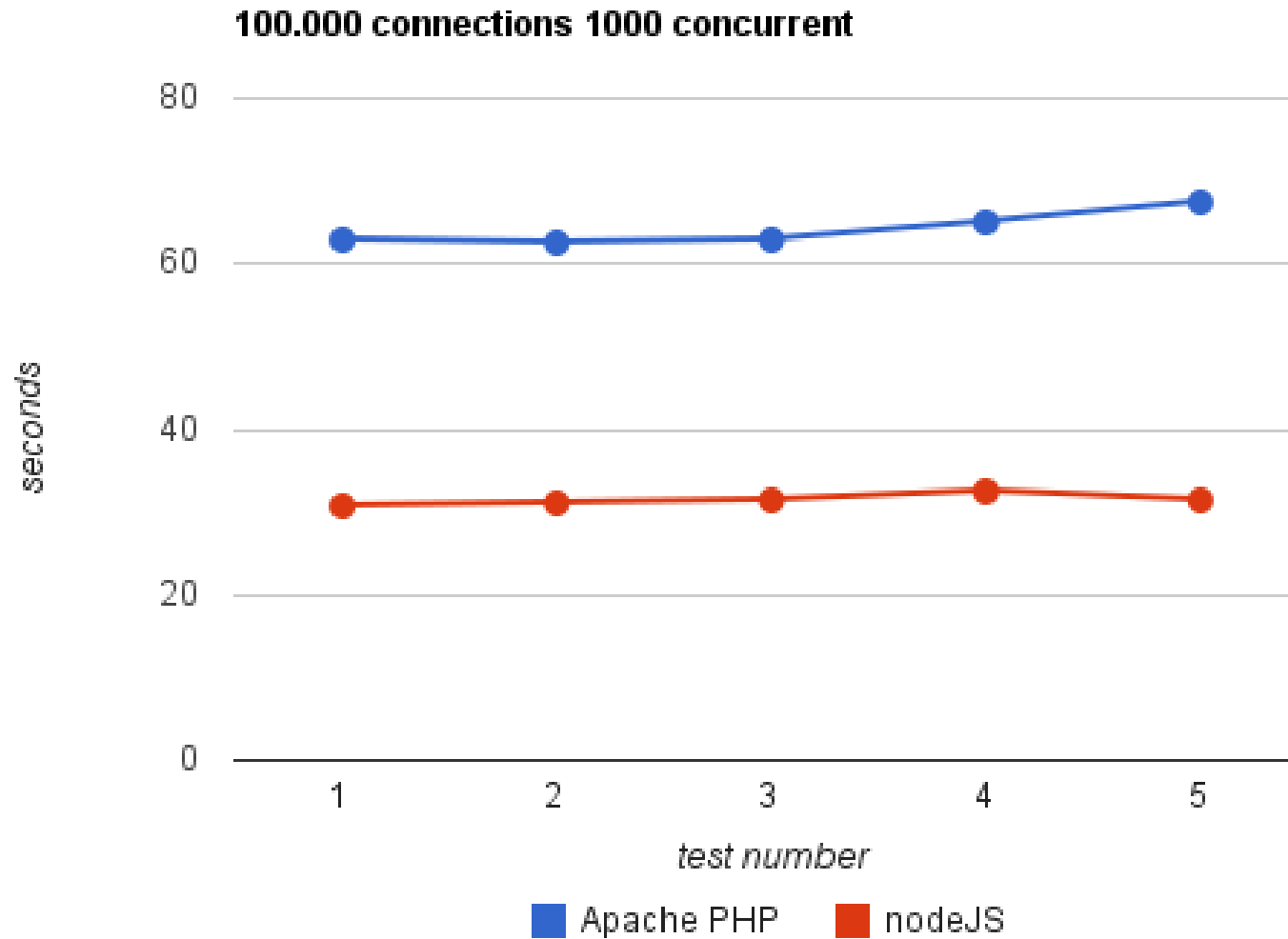
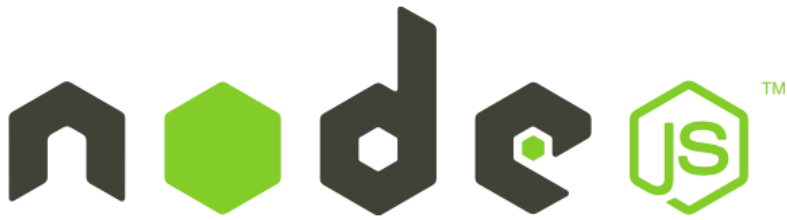
# Webserver

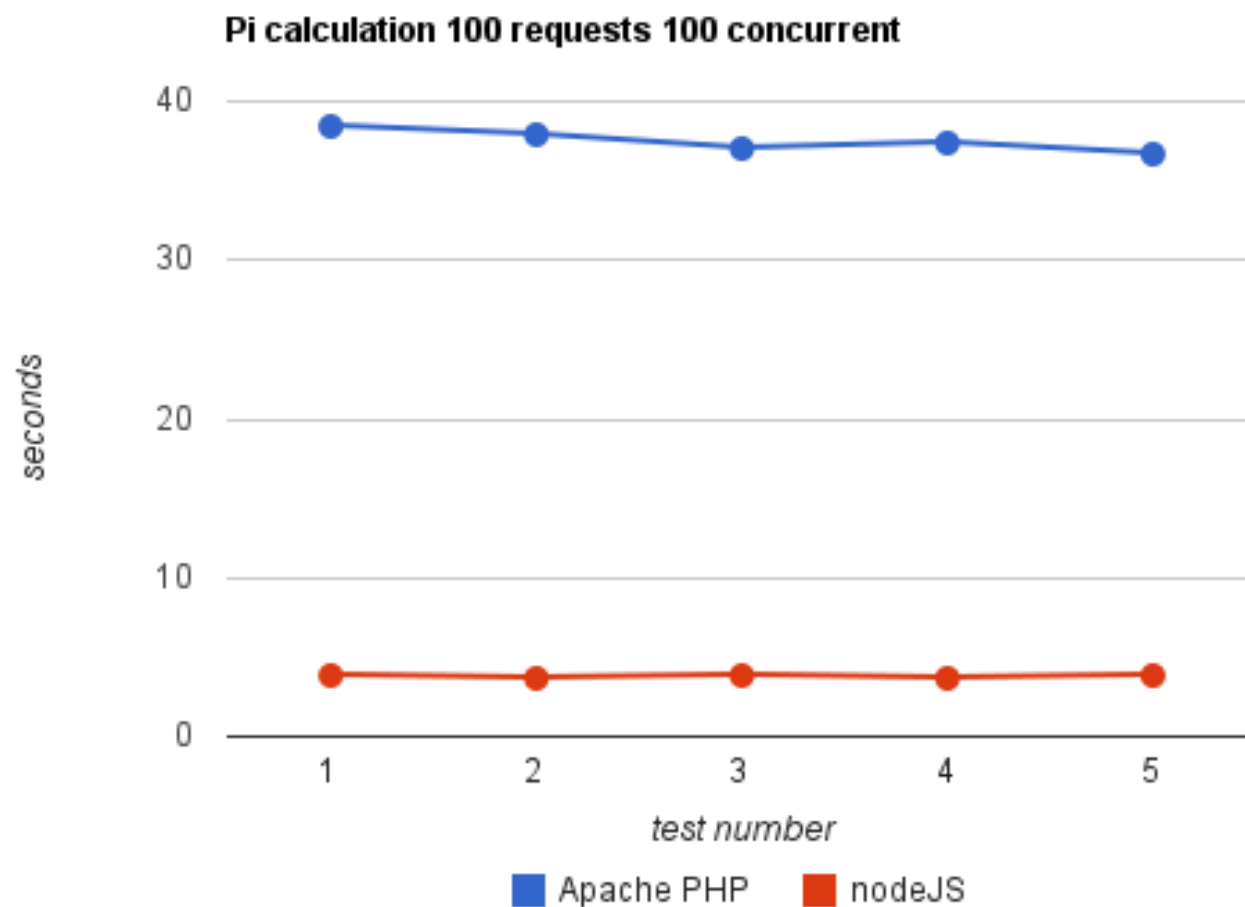


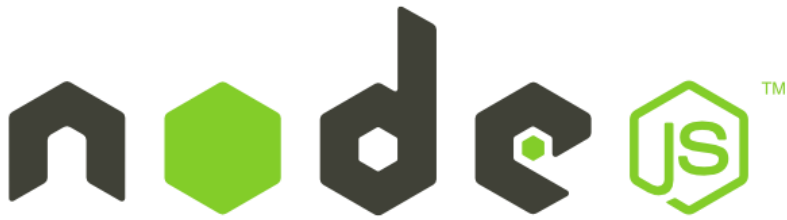
- No global variables
- URL rewrite with Apache mod\_rewrite in .htaccess
- Thread Blocking
- WebSockets!!
- Libraries not packaged



- Uses V8 JavaScript Engine by Google for Chrome **FAST**
- Event-driven, server-side JavaScript environment **NO BLOCKING**
- Database/File/Sockets libraries are written asynchronously **NO BLOCKING**

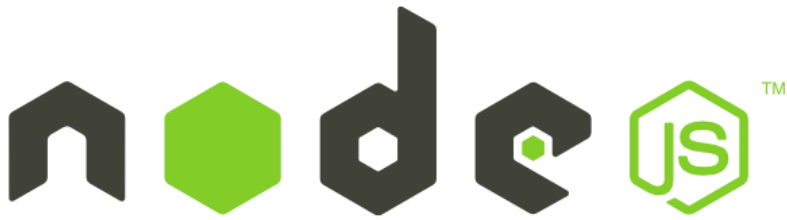






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- Event-driven, server-side JavaScript environment **NO BLOCKING**
- Database/File/Sockets libraries are written asynchronously **NO BLOCKING**
- Node package manager (npm): install 3rd party libraries **PACKAGING**
- JSON = JavaScript Object Notation **MongoDB**

```
var fly = {  
  "name": "Drosophila melanogaster",  
  "habitats": ["temperate", "tropical", "terrestrial"]  
};
```



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- Event-driven, server-side JavaScript environment **NO BLOCKING**
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- Node package manager (npm): install 3rd party libraries (c++/js) **PACKAGING**
- JSON = JavaScript Object Notation **MongoDB**

```
1  function sum(a, b) {  
2      var c = a + b;  
3      return c;  
4  }  
5  
6  console.log(sum(1, 2));|
```

```
> node app.js  
3
```